

CLAIMS

1. A method of operating an electric motor, comprising:
 - a) applying a train of pulses to the motor; and
 - b) while keeping motor speed substantially constant, modulating frequency of the pulses.
2. The method according to claim 1, wherein duty cycle of the pulses is kept substantially constant while frequency is modulated.
3. The method according to claim 1, wherein frequency of the pulses is varied from a first frequency f_1 to a second frequency f_2 which is 3 to 7 times larger than f_1 .
4. The method according to claim 2, wherein frequency of the pulses is varied from a first frequency f_1 to a second frequency f_2 which is 3 to 7 times larger than f_1 .
5. The method according to claim 4, wherein frequency f_1 is about 1,000 Hz.
6. The method according to claim 1, and further comprising:
 - c) using said motor to power a component in a vehicle.
7. The method of operating an electric motor, comprising:
 - a) applying PWM power of substantially constant duty cycle to the motor; and
 - b) while applying said PWM power, varying harmonic content of said power.

8. The method according to claim 5, and further comprising:
using said motor to power a component in a vehicle.
9. The method according to claim 3, and further comprising:
using said motor to power a component in a vehicle.
10. The method according to claim 2, and further comprising:
using said motor to power a component in a vehicle.
11. The method according to claim 4, and further comprising:
using said motor to power a component in a vehicle.
12. The method according to claim 7, wherein a selected group of harmonics of said power occupies a first bandwidth at one time and said group of harmonics occupies a second bandwidth, double the first bandwidth, at another time.
13. The method according to claim 7, wherein varying the harmonic content causes at least one harmonic frequency to change from a first frequency f_1 to a second frequency f_2 , this is 30 – 100 percent greater than f_1 .
14. The method according to claim 7, wherein said motor is contained in a motor vehicle, and the harmonic content produces noise in a speaker of a communication device in the vehicle.
15. The method according to claim 7 wherein varying the harmonic content causes at least one harmonic to vary from a first frequency f_1 randomly to a second frequency f_2 .

16. The method as recited in claim 7 wherein a switching between a first frequency f_1 and a second frequency f_2 is performed randomly.
17. The method according to claim 7 wherein varying the harmonic content causes a switch from a frequency f_1 to a frequency f_2 that is a random frequency.
18. An apparatus, comprising:
 - a) a motor vehicle;
 - b) an electric motor within the vehicle;
 - c) a PWM controller which
 - i) applies pulses to the electric motor and
 - ii) shifts base frequency of the pulses while keeping motor speed substantially constant.
19. The apparatus according to claim 18, wherein the PWM controller alters frequency spectrum of the pulses through the shifts.
20. A method, comprising:
 - a) maintaining an electric motor within a motor vehicle;
 - b) applying power pulses to the electric motor; and
 - c) shifting base frequency of the power pulses while motor speed is substantially constant.
21. The method according to claim 20, wherein shifting of the base frequency alters spectral content of the pulses.
22. The method according to claim 6, wherein the vehicle includes a communication device and said modulating shifts frequency of noise in said communication device.

23. The method according to claim 18, wherein the vehicle includes a communication device and shifting said base frequency shifts frequency of noise in said communication device.